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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/821,915 | 04/12/2004 | Takaharu Yamano | 300.1152 | 2431 |
| 21171 | 7590 | 11/16/2005 | EXAMINER | |
| STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005 | | | VU, HUNG K | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2811 | |

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/821,915

Applicant(s)

YAMANO ET AL.

Examiner

Hung Vu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/12/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Invention of Group I, Claims 1-10, in the reply filed on 10/28/05 is acknowledged.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

3. Claims 2-10 are objected to because of the following informalities: In claims 2-10, line 1, "A" should be changed to "The", for clarity. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 are rejected under 35 U.S.C. 102(a) as being anticipated by Tsai et al. (PN 6,713,856).

Tsai et al. discloses, as shown in Figures 2-3, a semiconductor package, wherein

the semiconductor package (10) is a stacked body formed by bonding two or more semiconductor devices (20&34,56&58) through an insulating layer (30,60);

each of the semiconductor device comprising a substrate and a device pattern formed on a surface thereof;

a device pattern surface of a lower semiconductor device faces a non-device pattern surface of a semiconductor device stacked on the lower semiconductor device.

Note that the term “obtained by collectively fabricating a plurality of semiconductor packages on a wafer in a batch process and dicing the resulting wafer product into discrete semiconductor packages” is method recitation in a device claimed. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 2, Tsai et al. discloses the semiconductor device positioned as the lowermost layer further comprising a heat radiation layer (27), formed of a material having a high heat transfer rate, on the non-device pattern surface thereof.

Regarding claim 3, Tsai et al. discloses the heat radiation layer is one deposited on the non-device pattern surface of a wafer as the lowermost layer. Note that the term “before said semiconductor packages are diced” is method recitation in a device claimed.

Regarding claim 4, Tsai et al. discloses the heat radiation layer is one of a thin film. Note that the term “formed by a thin film formation technology” is method recitation in a device claimed.

Regarding claim 5, Tsai et al. discloses the heat radiation layer is made of copper, aluminum or an alloy.

Regarding claim 6, Tsai et al. discloses the heat radiation layer also acts as a support.

Regarding claim 7, Tsai et al. discloses the insulating layer comprises a polyimide resin or an epoxy resin.

Regarding claim 8, Tsai et al. discloses the semiconductor device positioned as the uppermost layer further comprises a resin sealing layer on the device pattern surface thereof, and the resin sealing layer is one formed on the device pattern surface of the wafer as the uppermost layer.

Note that the term “before said semiconductor package is dice” is method recitation in a device claimed.

5. Claims 1, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Lauterbach et al. (PN 6,313,517).

Lauterbach et al. discloses, as shown in Figure 6, a semiconductor package, wherein

the semiconductor package is a stacked body formed by bonding two or more semiconductor devices (S1,S2) through an insulating layer (VS);

each of the semiconductor device comprising a substrate and a device pattern formed on a surface thereof;

a device pattern surface of a lower semiconductor device faces a non-device pattern surface of a semiconductor device stacked on the lower semiconductor device.

Note that the term “obtained by collectively fabricating a plurality of semiconductor packages on a wafer in a batch process and dicing the resulting wafer product into discrete semiconductor packages” is method recitation in a device claimed. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 7, Lauterbach et al. discloses the insulating layer comprises a polyimide resin or an epoxy resin.

Regarding claim 9, Lauterbach et al. discloses the device patterns of the semiconductor devices stacked are electrically connected to one another through a rewiring layer and a substrate through-electrode (VK) that formed in one semiconductor device. Note that the term “are simultaneously formed in one semiconductor device” is method recitation in a device claimed.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lauterbach et al. (PN 6,313,517).

Lauterbach et al. discloses all of the claimed limitations except material of the re-wiring layer and the substrate through-electrode. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the re-wiring layer and the substrate through-electrode of Lauterbach et al. having the materials as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday to Friday 6:00-4:30.

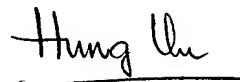
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272 - 1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vu

November 10, 2005

A handwritten signature in black ink, appearing to read "Hung Vu", written over a horizontal line.

Hung Vu

Primary Examiner